

## SECTION 15140 - PIPE HANGERS AND SUPPORTS

**APPROVED**

*By John Conway, CMG (Laptop) at 8:08 am, Jun 06, 2011*

### Part I - GENERAL

#### 1.01 SECTION INCLUDES

- A. The work covered under this section consists of the furnishing of all necessary labor, supervision, materials, equipment, and services to completely execute the pipe hanger and supports as described in this specification.

#### 1.02 REFERENCES

- A. ASTM B 633 - Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
- B. ASTM A 123 - Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- C. ASTM A 653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- D. ASTM A 1011 - Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, and High-Strength Low-Alloy with Improved Formability.
- E. MSS SP-58 - Manufacturers Standardization Society: Pipe Hangers and Supports - Materials, Design, and Manufacture.
- F. MSS SP-69 - Manufacturers Standardization Society: Pipe Hangers and Supports - Selection and Application.
- G. NFPA 13 - Installation of Sprinkler Systems.

#### 1.03 QUALITY ASSURANCE

- A. Hangers and supports used in fire protection piping systems shall be listed and labeled by Underwriters Laboratories.
- B. Steel pipe hangers and supports shall have the manufacturers name, part number, and applicable size stamped in the part itself for identification.
- C. Hangers and supports shall be designed and manufactured in conformance with MSS SP-58.
- D. Supports for sprinkler piping shall be in conformance with NFPA 13.

#### 1.04 SUBMITTALS

- A. Submit product data on all hanger and support devices, including shields and attachment methods. Product data to include, but not limited to materials, finishes, approvals, load ratings, and dimensional information.

### Part II - PRODUCTS

#### 2.01 ACCEPTABLE MANUFACTURERS

- A. Manufacturer: Subject to compliance with these specifications, pipe hanger and support systems shall be as manufactured by Cooper B-Line, Inc.

#### 2.02 PIPE HANGERS AND SUPPORTS

- A. Hangers
  - 1. Uninsulated pipes 2 inch and smaller:
    - a. Adjustable steel swivel ring (band type) hanger, Cooper B-Line B3170.
    - b. Adjustable steel swivel J-hanger, Cooper B-Line B3690.
    - c. Malleable iron ring hanger, Cooper B-Line B3198R or hinged ring hanger, B3198H.
    - d. Government type hanger, Cooper B-Line B3225 or B3226.
    - e. Adjustable steel clevis hanger, Cooper B-Line B3104 or B3100.

2. Uninsulated pipes 2<sup>1</sup>/<sub>2</sub> inch and larger:
    - a. Adjustable steel clevis hanger, Cooper B-Line B3100.
    - b. Pipe roll with sockets, Cooper B-Line B3114.
    - c. Adjustable steel yoke pipe roll, Cooper B-Line B3110.
  3. Insulated pipe - Hot or steam piping:
    - a. 2 inch and smaller pipes: use adjustable steel clevis with galvanized sheet metal shield, Cooper B-Line B3100 with B3151 or B3153 series.
    - b. 2<sup>1</sup>/<sub>2</sub> inch and larger pipes:
      - i. Adjustable steel yoke pipe roll with pipe covering protection saddle, Cooper B-Line B3110 with B3160 - B3165 series.
      - ii. Pipe roll with sockets with pipe covering protection saddle, Cooper B-Line B3114 with B3160 - B3165 series.
  4. Insulated pipe - Cold or chilled water piping:
    - a. 5 inch and smaller pipes: use adjustable steel clevis with galvanized sheet metal shield, Cooper B-Line B3100 with B3151 or B3153 series.
    - b. 6 inch and larger pipes:
      - i. Adjustable steel yoke pipe, Cooper B-Line B3110, with B3380CW - B3384CW calcium silicate shield.
      - ii. Pipe roll with sockets, Cooper B-Line B3114, with B3380CW - B3384CW calcium silicate shield.
- B. PIPE CLAMPS**
1. When flexibility in the hanger assembly is required due to horizontal movement, use pipe clamps with weldless eye nuts, Cooper B-Line B3140 or B3142 with B3200. For insulated lines use double bolted pipe clamps, Cooper B-Line B3144 or B3146 with B3200.
- C. MULTIPLE OR TRAPEZE HANGERS**
1. Trapeze hangers shall be constructed from 12 gauge roll formed ASTM A 1011 SS Gr. 33 structural steel channel, 1<sup>5</sup>/<sub>8</sub>" x 1<sup>5</sup>/<sub>8</sub>" minimum, Cooper B-Line B22 strut or stronger as required.
  2. Mount pipes to trapeze with two piece pipe straps sized for outside diameter of pipe, Cooper B-Line B2000 series.
  3. For pipes subjected to axial movement:
    - a. Strut mounted roller support, Cooper B-Line B3126. Use pipe protection shield or saddles on insulated lines.
    - b. Strut mounted pipe guide, Cooper B-Line B2417.
- D. WALL SUPPORTS**
1. Pipes 4 inch and smaller:
    - a. Carbon steel hook, Cooper B-Line B3191.
    - b. Carbon steel J-hanger, Cooper B-Line B3690.
  2. Pipes larger than 4 inch:
    - a. Welded strut bracket and pipe straps, Cooper B-Line B3064 and B2000 series.
    - b. Welded steel brackets, Cooper B-Line B3066 or B3067, with roller chair or adjustable steel yoke pipe roll. Cooper B-Line B3120 or B3110. Use pipe protection shield or saddles on insulated lines.

## E. FLOOR SUPPORTS

1. Hot piping under 6 inch and all cold piping:
  - a. Carbon steel adjustable pipe saddle and nipple attached to steel base stand sized for pipe elevation, Cooper B-Line B3093 and B3088T or B3090 and B3088. Pipe saddle shall be screwed or welded to appropriate base stand.
2. Hot piping 6 inch and larger:
  - a. (Adjustable) Roller stand with base plate, Cooper B-Line B3117SL (or B3118SL).
  - b. Adjustable roller support and steel support sized for elevation, Cooper B-Line B3124

## F. VERTICAL SUPPORTS

1. Steel riser clamp sized to fit outside diameter of pipe, Cooper B-Line B3373 or B3374.

## G. COPPER TUBING SUPPORTS

1. Hangers shall be sized to fit copper tubing outside diameters.
  - a. Adjustable steel swivel ring (band type) hanger, Cooper B-Line B3170CT.
  - b. Malleable iron ring hanger, Cooper B-Line B3198CT or hinged ring hanger B3198HCT.
  - c. Government type hanger, Cooper B-Line B3225CT or B3226CT.
  - d. Adjustable steel clevis hanger, Cooper B-Line B3104CT.

## H. PLASTIC PIPE SUPPORTS

1. V-bottom clevis hanger with galvanized 18 gauge continuous support channel, Cooper B-Line B3106 and B3106V, to form a continuous support system for plastic pipe or flexible tubing.

## I. SUPPLEMENTARY STRUCTURAL SUPPORTS

1. Design and fabricate supports using structural quality steel bolted framing materials as manufactured by Cooper B-Line. Channels shall be roll formed, 12 gauge ASTM A 1011 SS Grade 33 steel, 1<sup>5</sup>/<sub>8</sub>" x 1<sup>5</sup>/<sub>8</sub>" or greater as required by loading conditions. Submit designs for pipe tunnels, pipe galleries, etc., to engineer for approval. Use clamps and fittings designed for use with the strut system.

## 2.04 UPPER ATTACHMENTS

### A. BEAM CLAMPS

1. Beam clamps shall be used where piping is to be suspended from building steel. Clamp type shall be selected on the basis of load to be supported, and load configuration.
2. C-Clamps shall have locknuts and cup point set screws, Cooper B-Line B351L, or B3036L. Top flange C-clamps shall be used when attaching a hanger rod to the top flange of structural shapes, Cooper B-Line B3034 or B3033. Refer to manufacturers' recommendation for setscrew torque. Retaining straps shall be used to maintain the clamp's position on the beam where required.
3. Center loaded beam clamps shall be used where specified. Steel clamps shall be Cooper B-Line B3050 or B3055. Malleable iron or forged steel beam clamps with cross bolt shall be Cooper B-Line B3054 or B3291 - B3297 series as required to fit beams.

### B. CONCRETE INSERTS

1. Cast in place spot concrete inserts shall be used where applicable, either steel or malleable iron body, Cooper B-Line B2500 or B3014. Spot inserts shall allow for lateral adjustment and have means for attachment to forms. Select insert nuts to suit threaded hanger rod sizes, Cooper B-Line N2500 or B3014N series.

2. Continuous concrete inserts shall be used where applicable. Channels shall be 12 gauge, ASTM A 1011 SS Grade 33 structural quality carbon steel, complete with styrofoam inserts and end caps with nail holes for attachment to forms. The continuous concrete insert shall have a load rating of 2,000 lbs/ft. in concrete, Cooper B-Line B22I, B32I, or B52I (B52I is limited to 1,500 lbs/ft.). Select channel nuts suitable for strut and rod sizes.

## 2.05 VIBRATION ISOLATION AND SUPPORTS

- A. For refrigeration, air conditioning, hydraulic, pneumatic, and other vibrating system applications, use a clamp that has a vibration dampening insert and a nylon inserted locknut. For copper and steel tubing use Cooper B-Line BVT series VibraClamps, for pipe sizes use BVP series.
- B. For larger tubing or piping subjected to vibration, use neoprene or spring hangers as required.
- C. For base mounted equipment use vibration pads, molded neoprene mounts, or spring mounts as required.
- D. Vibration isolation products as manufactured by Cooper B-Line, VibraTrol systems.

## 2.06 ACCESSORIES

- A. Hanger rods shall be threaded both ends, Cooper B-Line B3205, or continuous threaded rods of circular cross section. Use adjusting locknuts at upper attachments and hangers. No wire, chain, or perforated straps are allowed.
- B. Shields shall be 180° galvanized sheet metal, 12 inch minimum length, 18 gauge minimum thickness, designed to match outside diameter of the insulated pipe, Cooper B-Line B3151.
- C. Pipe protection saddles shall be formed from carbon steel, 1/8 inch minimum thickness, sized for insulation thickness. Saddles for pipe sizes greater than 12 inch shall have a center support rib.

## 2.07 FINISHES

### INDOOR FINISHES

- A. Hangers and clamps for support of bare copper piping shall be coated with copper colored epoxy paint, Cooper B-Line Dura-Copper. Additionally a plastic coating or a felt lining in hanger can be used.
- B. Hangers for other than bare copper pipe shall be zinc plated in accordance with ASTM B 633 - SC3 or shall have an electro-deposited green epoxy finish, Cooper B-Line Dura-Green.
- C. Strut channels shall be pre-galvanized in accordance with ASTM A 653 G90 or have an electro-deposited green epoxy finish, Cooper B-Line Dura-Green.

### OUTDOOR AND CORROSIVE AREA FINISHES

- D. Hangers and strut located outdoors shall be hot dip galvanized after fabrication in accordance with ASTM A 123. All hanger hardware shall be hot-dip galvanized or stainless steel. Zinc plated hardware is not acceptable for outdoor or corrosive use.
- E. Hangers and strut located in corrosive areas shall be Type 304 (316) stainless steel with stainless steel hardware.

## Part III - EXECUTION

### 3.01 PIPE HANGERS AND SUPPORTS

- A. Pipe shall be adequately supported by pipe hanger and supports specified in PART II - PRODUCTS. Hangers for insulated pipes shall be sized to accommodate insulation thickness.
- B. Horizontal steel piping shall be supported in accordance with MSS SP-69 Tables 3 and 4, excerpts of which follow below:

NOMINAL PIPE SIZE	ROD DIAMETER	MAXIMUM SPACING
3/8" - 1 1/4"	3/8"	7'-0"
1 1/2"	3/8"	9'-0"
2"	3/8"	10'-0"
2 1/2"	1/2"	11'-0"
3"	1/2"	12'-0"
3 1/2"	1/2"	13'-0"
4"	5/8"	14'-0"
5"	5/8"	16'-0"
6"	3/4"	17'-0"
8"	3/4"	19'-0"
10"	7/8"	22'-0"
12"	7/8"	23'-0"
14"	1"	25'-0"
16"	1"	27'-0"

- C. Horizontal copper tubing shall be supported in accordance with MSS SP-69 Tables 3 and 4, excerpts of which follow below:

NOMINAL PIPE SIZE	ROD DIAMETER	MAXIMUM SPACING
1/4" - 3/4"	3/8"	5'-0"
1"	3/8"	6'-0"
1 1/4"	3/8"	7'-0"
1 1/2"	3/8"	8'-0"
2"	3/8"	8'-0"
2 1/2"	1/2"	9'-0"
3"	1/2"	10'-0"
3 1/2"	1/2"	11'-0"
4"	1/2"	12'-0"
5"	1/2"	13'-0"
6"	5/8"	14'-0"
8"	3/4"	16'-0"

- D. Provide means of preventing dissimilar metal contact such as plastic coated hangers, copper colored Cooper B-Line Dura-Copper epoxy paint, or non-adhesive isolation tape (Cooper B-Line Iso-Pipe). Galvanized felt isolators sized for copper tubing may also be used, Cooper B-Line B3195CT.

- E. Support horizontal cast iron pipe adjacent to each hub, with 10 feet maximum spacing between hangers.
- F. Install hangers to provide a minimum of 1/2 inch space between finished covering and adjacent work.
- G. Place a hanger within 12 inches of each horizontal elbow.
- H. Support vertical piping independently of connected horizontal piping. Support vertical pipes at every (other) floor. Wherever possible, locate riser clamps directly below pipe couplings or shear lugs.
- I. Where several pipes can be installed in parallel and at the same elevation, provide trapeze hangers as specified in Section 2.02 C. Trapeze hangers shall be spaced according to the smallest pipe size, or install intermediate supports according to schedule in Section 3.01 B.
- J. Do not support piping from other pipes, ductwork or other equipment which is not building structure.

## 3.02 CONCRETE INSERTS

- A. Provide inserts for placement in formwork before concrete is poured.
- B. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- C. Where concrete slabs form finished ceilings, provide inserts to be flush with slab surface.
- D. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inch.